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09/781,631	02/12/2001	Konstantinos Papathomas	END919990060US1	9523

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EXAMINER

MOORE, MARGARET G

ART UNIT	PAPER NUMBER
1712	13

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Please find below and/or attached an Office communication concerning this application or proceeding.

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT PAPER

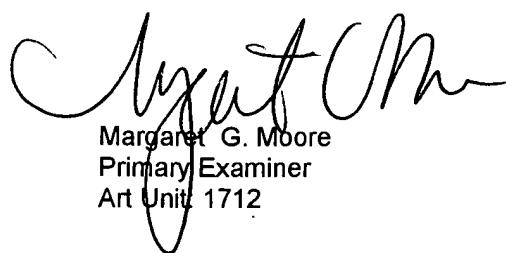
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**Commissioner for Patents**

The IDS filed 6/9/03 has been received and placed in the application. Since the IDS was not properly filed, it has not been considered. Specifically note that applicants' Transmittal of Information Disclosure Statement indicates that the IDS complies with 37 CFR 1.97c, but in fact it does not, since it was submitted after the final rejection.



Margaret G. Moore  
Primary Examiner  
Art Unit 1712



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 13

Application Number: 09/781,631

Filing Date: February 12, 2001

Appellant(s): PAPATHOMAS, KONSTANTINOS

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Dave Banner  
For Appellant

**MAILED**

**EXAMINER'S ANSWER**

JUL 29 2003

**GROUP 1700**

This is in response to the appeal brief filed March 19, 2003.

**(1) Real Party in Interest**

A statement identifying the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) Status of Claims**

The statement of the status of the claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Invention**

The summary of invention contained in the brief is deficient because it does not adequately reflect that which is being claimed. Please note the following:

1) Independent claim 31 is drawn to a silica filled encapsulant composition that comprises a core-shell substance with particular glass transition temperature requirements for both the core and the shell. None of the ingredients noted on the top of page 4 of the Appeal Brief are required in this composition. Appellants do not provide any mention of this "invention" in the summary of invention.

2) Independent claims 52 and 62 are drawn to methods of encapsulating using the silica filled encapsulating composition noted above. Again, appellants provide no mention of this "invention" in the summary of invention.

3) The Summary of the Invention states that there are requirements on the coefficient of thermal expansion, but this is not a limitation in any of the independent claims.

The silica filled encapsulant material noted on the top of page 4 generally reflects the subject matter in claims 36, 42 and 47.

**(6) Issues**

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows:

1) Appellants state that claims 41, 43 *through* 48 are rejected under 35 USC 112 as being indefinite, but only claims 41, 43 *and* 48 are rejected as such.

2) Appellants make no mention of the fact that claims 41 and 43 are rejected under 35 USC 102(e)/103 over Tang et al. Rather, they include claims 41 and 43 in the rejection under 35 USC 103.

3) Appellants make no mention of the fact that claims 31, 32, 34 and 35 are rejected under 35 USC 102(e) over Usui et al.

4) The Examiner would like to clarify that claim 43 is rejected under 35 USC 102(b)/103 over Hanyu et al. Appellants included claim 43 separately in the rejections under 102 and 103.

**(7) Grouping of Claims**

Appellant's brief includes a statement that the claims cannot be grouped together but it is unclear what appellants intend by this statement since they do not specifically state that any claims do stand or fall together. They state that claims 52 through 70 recite a method of encapsulating an Integrated Circuit Chip and an **organic substrate only** but this is not true. Claim 62 is drawn to a method of encapsulating a **ceramic substrate**. Appellants state that the diversity of the claims requires separate consideration and grouping but, again, they do not state what that grouping should be.

Thus, for the purposes of this appeal, the Examiner will consider the following groups of claims to stand or fall together: Claims 31 to 35, Claims 36 to 41, Claims 42 to 46, Claims 47 to 51, Claims 52 to 61 and Claims 62 to 70. Appellants do not indicate that any of the dependent claims stand or fall separately from the independent claim upon which they depend and, when traversing the prior art rejection, appellants do not separately argue dependent claim limitations. As such the Examiner assumes that appellants intend for all dependent claims to stand or fall with the independent claim.

**(8) ClaimsAppealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

5,747,557	Hanyu et al.	5-1998
6,288,169	Usui et al.	9-2001
6,037,392	Tang et al.	3-2000
6,106,891	Kulesza et al.	8-2000
3,965,212	Kamada et al.	6-1976
4,210,739	Gallagher et al.	7-1980
4,226,926	Goldberg et al.	10-1980

**(10) Ground for rejection**

The following ground(s) of rejection are applicable to the appealed claims:

1) Claims 35, 36, 54, 56 and 66 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has failed to indicate where support can be found for these newly added claim limitations and since the Examiner cannot find support, they are considered to be new matter.

Claims 35, 56 and 66:

As amended, the epoxy resin is selected from the group of epoxy resins consisting of polyimides, cyanate esters and combinations thereof. The specification fails to teach such a group of epoxy resins. See pages 3 and 4 and specifically note that the bottom of page 3 teaches epoxies, cyanate esters and bis-maleimides cyanate esters-epoxy polyimides as three separate types of resins, not that cyanate esters and bis-maleimides cyanate esters-epoxy polyimides are part of the epoxy group.

Claim 36:

The Examiner cannot find support for the limitation "at least one aliphatic polyol substance of between approximately 0 and 2 percent". See for instance page 9. Note that a first polyol in an amount of between approximately 1 and 2 and a second polyol in an amount of between approximately 0 and 1 does not support the claimed amount of between approximately 0 and 2.

Claim 54:

The Examiner cannot find support for this limitation as it applies to a ceramic substrate. See the top of page 2 in the specification which specifies organic substrates.

2) Claims 41 and 42 to 51 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as

to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 41, 43 and 48:

These claims require a particular "toughness" value, but the specification fails to describe the type or measurement of "toughness" and as such there does not appear to be adequate enablement in the specification for the skilled artisan to arrive at this limitation. See page 10. In addition, since the means by which the toughness is measured is not mentioned, it would require undue experimentation for one having ordinary skill in the art to arrive at such a composition.

This rejection is based on the fact that one cannot determine how the claimed toughness is measured and thus this limitation is not enabled. To support the fact that toughness can be measured in various ways and that without a teaching of how the toughness is measured it would require undue experimentation for the skilled artisan to make this composition, the Examiner draws attention to a) Goldberg et al., which teaches that "the various measures to toughness... are tensile strength... and flexibility" on column 11, lines 47 to 55, b) Gallagher et al., which teaches on column 1, lines 60 to 65, that "toughness can be determined by..." and cite specific ASTM tests, c) Kamada et al., which teaches on column 6, lines 35 to 40, a specific test that is used to determine toughness, and d) Tang et al., which teaches on column 14, lines 16 and 17, that fracture toughness is measured by a specific published method. The Examiner notes that there is tensile toughness, fracture toughness and various other types of "toughness" that can be measured. One having ordinary skill in the art cannot duplicate this method because one does not know what the method is. While standards for testing toughness are well known, there are many different standards.

Claims 42 to 51:

The specification teaches that the core-shell component is required in the inventive composition to achieve the improved mechanical properties described therein. See for instance page 8, which includes the statement that "the invention features an underfill composition having improved mechanical properties resulting from the inclusion

of a novel "core-shell" substance". The skilled artisan would not have been enabled by the specification to make a composition that does not contain such an additive.

3) Claims 41, 43 and 48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is embraced by this "toughness" measurement since the means for testing toughness, or the type of toughness, is not defined. The breadth of this claim is unclear and confusing. As noted above, there are many types of "toughness" and testing toughness can be done by many different ways. There is nothing indicating that the skilled artisan would have known how toughness is measured or the type of toughness being claimed and thus it is unclear what is embraced by these limitations.

4) Claims 37, 54, 57, 58, 67 and 68 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

For claim 37, limiting the epoxy resin to a cycloaliphatic epoxy resin is not considered to be further limiting of claim 35 since a cycloaliphatic epoxy resin is not an epoxy resin selection in claim 35.

For claim 54, reference to "said ceramic substrate" lacks antecedent basis and thus it is unclear how this claim is considered to be further limiting.

For claims 57, 58, 67 and 68, reference to "said epoxy resin" lacks antecedent basis and thus it is unclear how this is considered to be further limiting.

5) Claims 31 to 33, 35, 37, 38, 42, 45 and 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Tang et al.

Tang et al. teach epoxy resin compositions containing a core-shell particle having a core Tg value of less than 0 °C. See the abstract. The shell is prepared from monomers having a Tg greater than room temperature. See for instance the various particles

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prepared on columns 10 to 12 (the Tg of MMA is 105°C). This anticipates claim 31. See the various working examples on columns 13 to 20 which include silica in an amount as claimed in claim 33 and 42 (silica in the form of quartz). Example 13 uses cycloaliphatic epoxy resin (meeting claim 37). Example 15 uses the anhydride of claim 46. Regarding claim 32, note that the coefficient of thermal expansion would be a property that is inherently associated with the composition and since the composition is met by Tang et al., this property would appear to have be inherently present in the composition of Tang et al. as well.

Regarding the fact that the claimed composition is an "encapsulant" composition, note column 8, lines 25 to 28, which teaches that the composition of Tang et al. is an encapsulating system. The Examiner notes that the future intended use limitation in the claims does not lend patentable weight to the claims over the prior art since a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. There is no structural difference between the claimed invention and the prior art, and as such Tang et al. anticipate the instant claims.

6) Claims 41 and 43 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tang et al.

Tang do not specifically teach this toughness limitation. However, toughness is a property that is inherently associated with a composition. Thus, since the composition of Tang et al. meets that claimed, it would appear that the composition inherently meets this toughness limitation as well. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

7) Claims 34, 36, 39, 40, 44, 47 to 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al.

Regarding claims 34, 40 and 44, the Examiner notes that the addition of a silane to epoxy encapsulating compositions, in an effort to couple the silica filler with the epoxy resin and to enhance insulating properties and durability, is well known in the art. The skilled artisan would have found the addition of a known component, in an effort to take advantage of the known benefits and properties associated therewith, to have been obvious.

Regarding claim 36 (as well as 39 and 47) the Examiner notes that Tang et al. do not show specific compositions containing these components; however, Tang et al. teach that both the cycloaliphatic epoxy and the methylhexahydrophthalic anhydride can be used in the composition therein. Column 8 teaches silica fillers having a particle size and an amount within the range of claim 36. Note too that the imidazoles component in claim 36 is not a required component. In view of the fact that Tang et al. teach each of the components required by these claim (with the exception of the silane, the obviousness of which is addressed *supra*) it would have been within routine experimentation of the teachings of Tang et al. for one having ordinary skill in the art to arrive at such a combination.

Regarding claims 52 and 62, note that Tang et al. teach as a preferred utility for the composition therein encapsulating electronic components. See column 8. Thus while Tang et al. do not specifically teach encapsulating an integrated circuit chip and a ceramic or organic substrate, the selection of an integrated chip and an organic or ceramic substrate would have been an obvious selection as an electronic component since integrated circuit chips are commonly encapsulated with epoxy resin compositions such as that taught by Tang et al. See also the Background of the Invention in the instant specification that acknowledges the known use of encapsulants in IC chips that the method steps claimed (i.e. curing and reflowing) are conventional method steps.

8) Claims 31, 32, 34 and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Usui et al.

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Usui et al. teach butadiene particles for epoxy resin encapsulants. The butadiene core will have a Tg below room temperature. This is covered with a polymer having a Tg of 70 °C or higher. See for instance column 3, lines 31 to 58. The silica filled epoxy resin compositions meet instant claims 31 and 35. See Table 2, in which the compositions contain a silane coupling agent and are silica filled.

With regards to claim 32, the Examiner relies on the rationale noted in paragraph 5 of section 8, *supra*, as it applies.

9) Claim 41 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Usui et al.

The Examiner relies on the rationale detailed in paragraph 6 of section 8, *supra*, as it applies.

10) Claims 52, 54 to 56, 62, 64 to 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al.

Usui et al. teach that the epoxy composition therein can be used to encapsulate IC chips. See for instance column 1, which refers to both ceramic and organic (plastic) substrates. This differs from the claimed method only in that patentees do not teach the step of reflowing solder joints. However as acknowledged by applicants on page 2 of their specification, this is a conventional step in the process of attaching chips to substrates. Thus the skilled artisan would have readily recognized the need for such a step, rendering this obvious.

11) Claims 42, 44 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Hanyu et al.

Hanyu et al. teach epoxy resin compositions. See for instance Example 18. This shows a composition having approximately 60 wt% silica, approximately between 14% and 25% epoxy resin and anhydride. Note that this composition contains a silane. The MH-700 meets claim 46. This anticipates the instant claims.

12) Claim 43 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hanyu et al.

The Examiner relies on the rationale detailed in paragraph 6 of section 8, *supra*, as it applies.

13) Claims 45 and 47 to 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanyu et al.

Hanyu et al. do not specifically show an example containing a cycloaliphatic epoxide, but note the bottom of column 2 which teaches that such epoxides can be used in the composition taught therein. As such the skilled artisan would have found the selection of such an epoxide to have been obvious.

With regards to the imidazole of claim 50, note that column 8, line 30, teaches the addition of imidazoles hardening accelerators. From this the skilled artisan would have realized that conventional imidazoles such as that in claim 50 could have been used in the composition of Hanyu et al., thereby rendering such a limitation obvious to the skilled artisan.

Finally, with regards to claim 51, note that wetting agents are common additives in epoxy electrical insulating casting compositions. The skilled artisan would have found the addition of such a known component obvious in an effort to obtain the known benefits and properties thereof. In view of this the skilled artisan would have found the addition of such a conventional additive to the composition of Hanyu et al. obvious.

14) In conclusion, the Examiner would like to add that she recognizes that there are numerous rejections in this action over different prior art references. She realizes that this could be confusing or seem to be, perhaps, redundant. However, to provide a complete examination, different references have been cited because some anticipate and/or render obvious some claims, while others anticipate and/or render obvious different claims. In addition, some references can be considered "closer" to certain claims than other references.

**(11) Response to Argument**

The Examiner will number her responses to correspond to the appellants' numbered arguments in the Appeal Brief.

1. Appellants refer generally to 6,106,891 as providing support for claims 35, 56 and 66. However, they fail to indicate where in 6,106,891 support can be found and the Examiner cannot find any. The top of column 3 refers to "epoxies, polyimides, cyanates" but this does not teach an epoxy resin selected from the group of polyimides and cyanate esters. As such this fails to overcome the rejection.

Appellants state that the top of page 5 recites the percentage of 0 to 2 percent. This is not true.

Appellants note that claim 52, from which claim 54 depends, is drawn to an organic substrate, not a ceramic substrate. This is true (note for instance the objection to claim 54 *supra*). Noting this, however, does not address the rejection in any.

2. The Examiner can find absolutely nothing on page 11 of the specification that supports claims 41 and 52 to 51. It is completely unclear how appellants believe that this overcomes the rejection.

3. In this response, appellants appear to combine two different rejections by stating that the claims have been rejected as being **indefinite**, then stating that the Office claims that the specification is **non-enabling**. Appellants state that they are allowed to recite the results of testing without having to recite the particulars of the machine or the engineering method used to obtain a toughness result, and they are correct in that they can recite such results but this does not mean they can claim such results. Appellants have provided no support (such as case law) for their position. They state that page 11 compares results to the prior art, but the Examiner cannot find this on page 11.

For some reason, appellants believe that since Tang et al. describe a standard, then appellants can be held to such a standard. However, extrapolating this rationale, if Hanyu et al. or Usui et al. teach a standard, then appellants could be held to those standards as well. But, if each standard were to be different, how could appellants be held to different standards depending on the prior art in question? If a prior art composition taught a toughness that met this limitation by one standard, but not by another,

how could one determine which standard is used in the claims? Appellants state that the standards for testing toughness are well known in the industry, but as the Examiner has already noted, there are numerous standards for measuring toughness. Appellants need to enable their claims and appellants need to claim their invention definitely and they simply have not done so.

4. In this response, appellants gloss over the objections by simply stating that they do not agree with the Office and that the limitations are proper. They do not, however, provide any support this position. In claim 35, the epoxy resin can only be a polyimide or a cyanate ester. The cycloaliphatic epoxy resin in 37 does not meet this limitation. For claim 54, appellants do not indicate where in claim 52 "said ceramic substrate" is found. For claims 57, 58, 67 and 68, appellants do not indicate where in claim 55 or claim 65 "said epoxy resin" is found. If antecedent basis for these terms can be found, then appellants should clearly show this.

5. With regards to the anticipation rejection over Tang et al., appellants arguments refer to numerous facts and problems, but they fail to address the basic fact that Tang et al. teach a composition that is the same as that claimed in claim 31 and 42. The arguments in the Appeal Brief appear to be a straw man since the specific facts or rationale behind this rejection is never addressed. Appellants refer to the FCA environment recited in the preamble of the claims, but a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, structural limitations are able to stand alone.

With regards to Appellants reference to the method claims, the Examiner never suggested that Tang et al. taught these method steps, but that they would have been obvious to one having ordinary skill in the art in view of the fact that they're conventional steps of encapsulating, and that Tang et al. teach using the composition as an encapsulant. Again, note the Background of the Invention. Appellants do not address the obviousness of the claimed method; again, they do not address the rejection rationale per se.

6. With regards to the rejection of claims 41 under 102/013 over Usui et al. and the rejection of claims 52, 54 to 56, 62 and 64 to 66 over Usui et al., this is not persuasive. Again, none of the claim limitations *per se* are addressed. Appellants state that Usui et al.'s teaching regarding a Tg is irrelevant, but the Examiner does not understand why, since there is a Tg requirement in claim 52 and 62. Appellants are of the position that Usui et al. is concerned with a different environment than the claims, but Usui et al. specifically refer to encapsulating IC chips on column 1, line 14. Appellants state that there is no teaching of a silica filled encapsulant, but the Examiner specifically referred to an example that shows such an encapsulant.

7. With regards to the rejection of claims 42 through 44 and 46 as anticipated by Hanyu et al., this too is not persuasive. Appellants state that Hanyu et al. do not teach the purpose of this invention, but again this refers to the future intended use of the composition which does not provide novelty for a composition that is already known for a different purpose. Each component claimed is found in the prior art. As such, this anticipation rejection is maintained.

The Examiner notes that appellants do not address some of the rejections in their response, such as the 102/103 and 103 rejections over Hanyu et al. In addition, the only mention of the 102 rejections over Hanyu et al. and Usui et al. is a brief statement on page 9 that these references are not concerned with organic substrates and that they don't present the compositions in the FCA environment recited in appellants' preamble. Organic substrates and the preamble in this instance do not carry patentable weight since the claims, particularly the composition claims, are fully defined by the components required. Also, the Examiner notes that appellants never once mention any of the dependent claim limitations. In fact, appellants hardly make any mention of *many* of the *claim* limitations. Appellants' arguments are more drawn to the theory and intent behind the claims and of the future intended use. The fact remains, however, that the prior art anticipates the compositions in claims 31 and 47 and renders obvious the compositions in claims 42 and 47. In addition, using the electronic encapsulating compositions of Tang et al. and Usui et al. to encapsulate an IC chip by a known method

would have been obvious to one having ordinary skill in the art, rendering obvious claims 52 and 62.

For the record the Examiner notes that, in her opinion, Appellants' arguments in this Appeal Brief and during prosecution are just one step away from failing to comply with 37 CFR 1.111(b) because they amount to general allegations that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Margaret G. Moore  
Primary Examiner  
Art Unit 1712

mgm  
July 27, 2003

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